

Continuous thermosalinograph oceanography along RV POLARSTERN cruise track PS111 (ANT-XXXIII/2) Data Processing Report

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1 Introduction

This report describes the processing of raw data acquired by the thermosalinographs on board RV Polarstern during expedition PS111 to receive cleaned up and corrected salinity data. Detailed description of the processing of the data and the workflow is given in the general report “General Processing Report of Surface T/S Data RV Polarstern Cruises PS106, PS107, PS108 and PS109”.

Cruise details

Vessel name: RV Polarstern
Cruise name: PS111 (ANT-XXXIII/2)
Cruise start: 2018-01-19
Cruise end: 2018-03-14
Cruise duration: 54 days
Working area: Weddell Sea

2 Sensor Details

Following sensors were installed during cruise PS111. Only data from **TSG2** are uploaded to PANGAEA for cruise PS111 and are furthermore considered in this report (for reasoning see General Processing Report).

	TSG1	TSG2
Serial number	SBE21-3203	SBE21-3354
Installation	2017-12-20	2017-12-20
Deinstallation	2018-06-15	2018-06-15
Days installed	177	177
External temperature sensor	SBE38-136	SBE38-154

3 Processing Report

Database Extraction

Data source	DSHIP database (dship.awi.de)
Start of raw file	2018-01-19T12:00:00
End of raw file	2018-03-14T07:59:59
Number of lines in hexadecimal raw file	4651200
First dataset	2018-01-19T13:08:46
Last dataset	2018-03-12T17:47:57
TSG1 valid data	1121201

Calculation of 10min means

The calculation of 10min means included the removal of outliers outside a 2-times standard deviation for each data interval. The number of outliers for each parameter are given here.

Number of outliers >2*std	
Internal temperature	37793
Conductivity	35476
External temperature	39163
Salinity	46898
Result after outlier removal	
Number 10-min-means	7476

Manual flagging

After processing the data were visually inspected. The whole data from a specific timestamp were deleted if there was only one parameter to be manually flagged. **0** data points were manually removed from the TSG2 dataset of PS111.

Assigning navigation data

Data from the corrected mastertrack of cruise PS111 were assigned to the 10min means of TSG2. A speed filter of 0.5 knots minimum speed is applied to avoid redundant data. See Figure 1 and Figure 2 for the processed and corrected data of TSG2.

Number of speed flags: 1724

Number of data in final output file: 5752

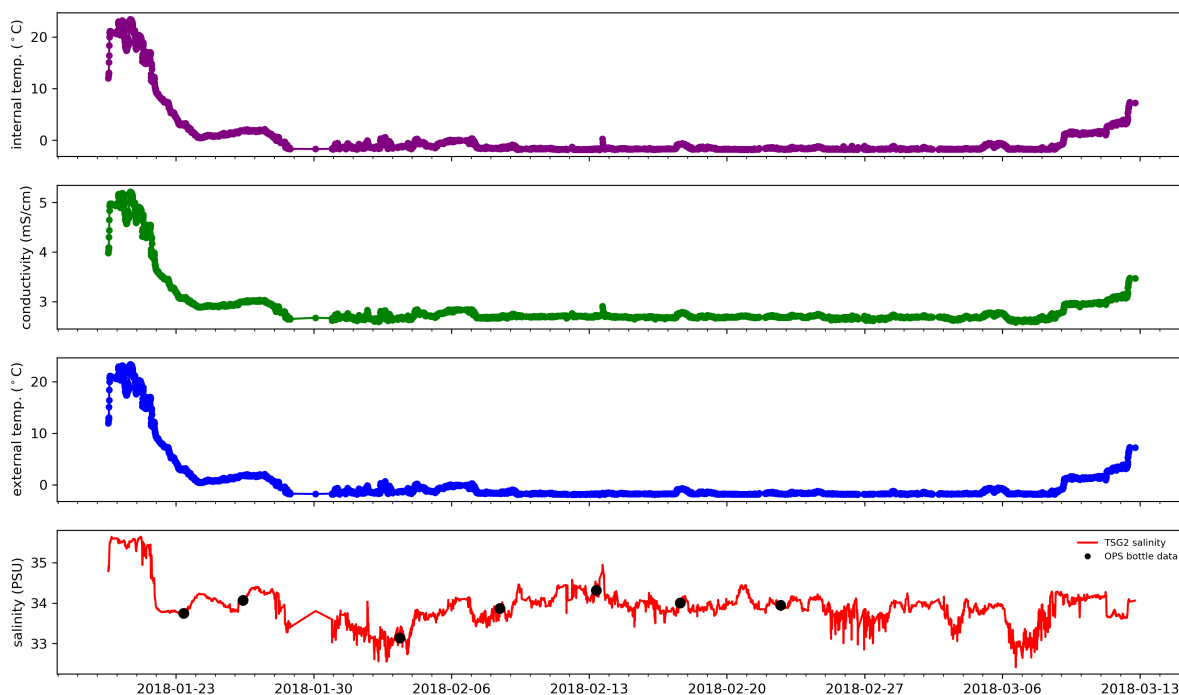


Figure 1: 10min means of data from TSG2

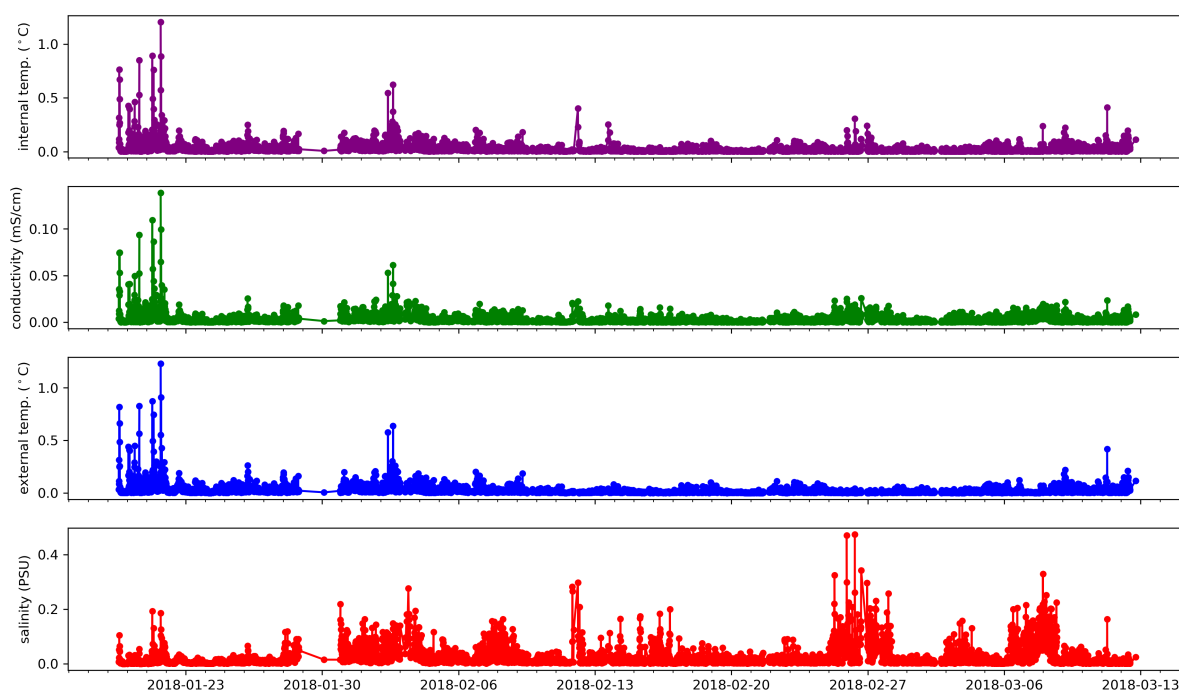


Figure 2: Standard deviations of 10min means of data from TSG2

Differences between internal and external temperature of TSG2 temperature sensors

Temperature differences between the internal and the external temperature sensors have to be small under normal circulation conditions. Means and standard deviations for the temperature differences as well as the number of data with a difference larger than 1 °C are given in the following table and are shown in Figure 3.

	TSG2 temperature difference	
	mean \pm standard dev.	no. > 1 °C
Spot values	0.0575 \pm 0.0902 °C	2601
10-min means	0.0575 \pm 0.0883 °C	17

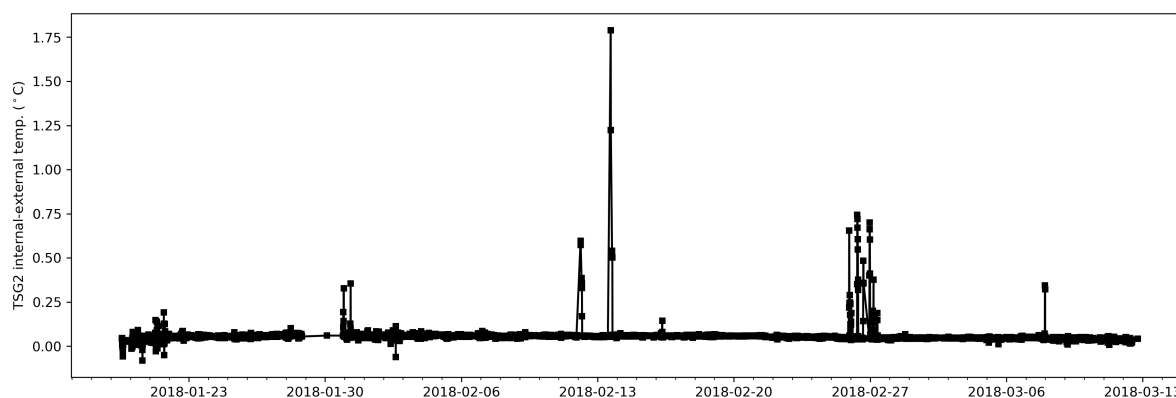


Figure 3: Differences between internal and external temperature sensors of TSG2

Result file

The result file is a plain text (tab-delimited values) file named **PS111_surf_oce.tab** with one data row in 10-min interval. For further information on the result file see the General Processing Report.

4 Appendix

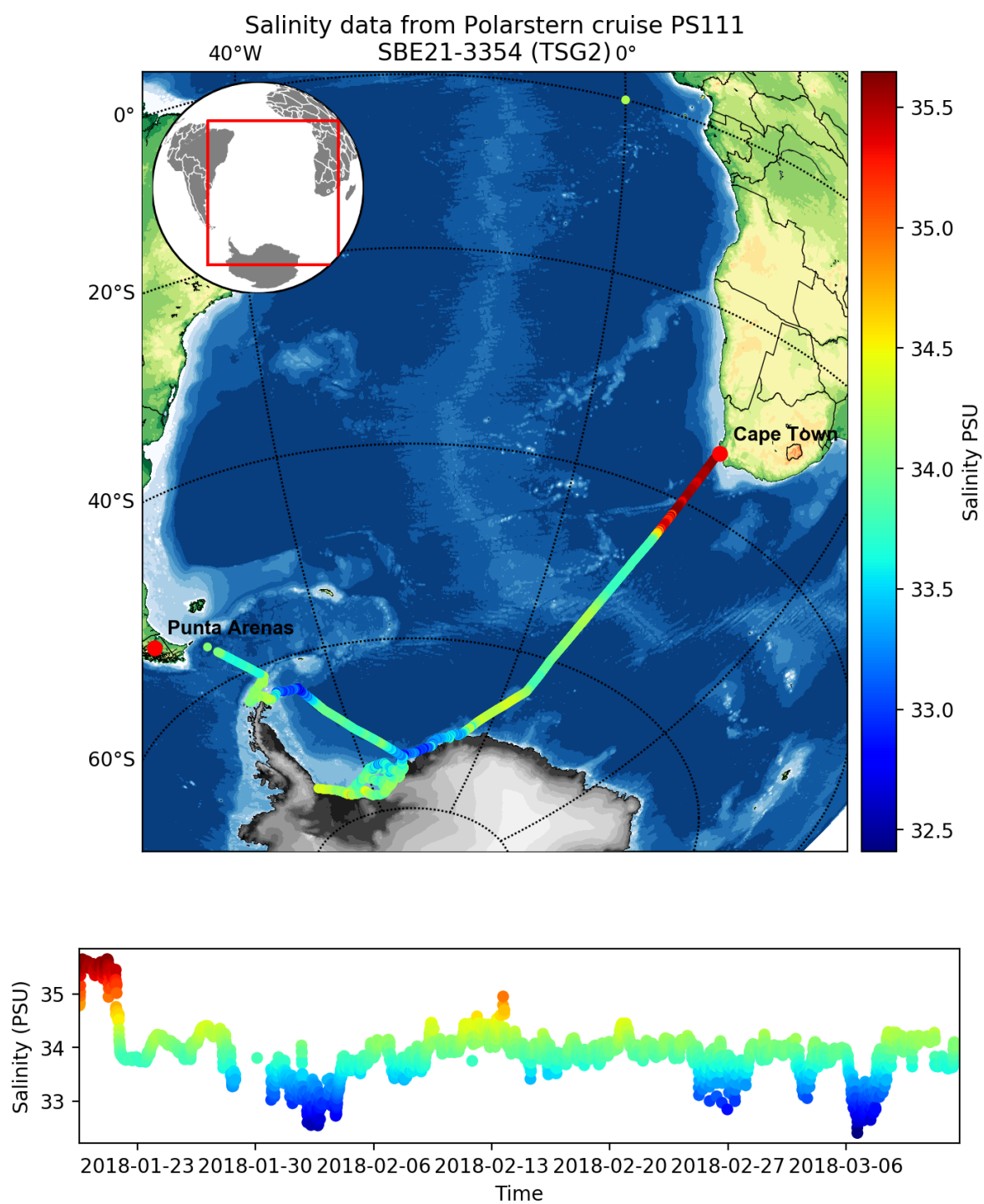


Figure 4: Salinity data from TSG2

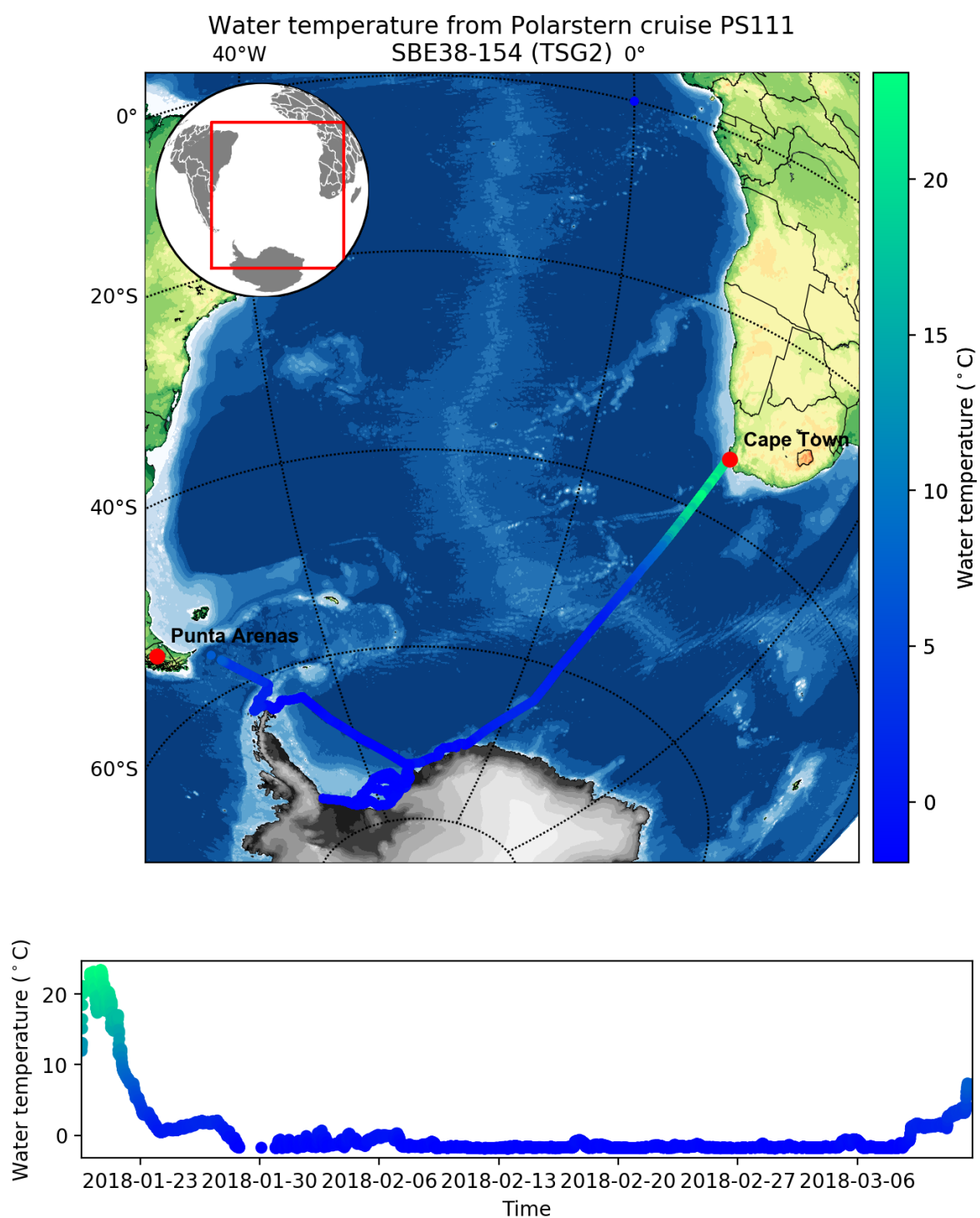


Figure 5: Temperature data from TSG2